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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Goran Nilsson et al.

Serial No.: 09/663,333

Group: 1731

Filed: September 18, 2000

Examiner: Lopez

For: USE OF A TRANSFER BELT FOR A SOFT TISSUE  
PAPER MACHINE

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RESPONSE TO OFFICE ACTION

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Commissioner of Patents  
Washington, D.C. 20231

S I R:

In response to the outstanding final Office Action of  
October 18, 2001 on the above-identified application, the  
Applicants respectfully submit the remarks to follow:

I hereby certify that this correspondence is being deposited  
with the United States Postal Service as first class mail in  
an envelope addressed: Commissioner for Patents,  
Washington, D.C. 20231, on March 18, 2002

John F. Gulbin

Signature

March 18, 2002

Date of Signature

The Commissioner is hereby authorized to charge any additional  
fees which may be required, or credit any overpayment to  
Account No. 501145, Order No. 503150.092372.

REMARKS

Eight claims are pending in the present application. All have been finally rejected in the outstanding Office Action of October 18, 2001.

Referring to page 2 of that action, claims 1 through 4, 6 and 8 were finally rejected under 35 U.S.C. §103(a) as being unpatentable for obviousness over U.S. Patent No. 5,393,384 (Steiner et al.) in view of U.S. Patent No. 5,298,124 (Eklund et al.).

As discussed in Applicants' response of August 10, 2001, Steiner et al. shows a tissue machine which includes an impermeable carrier belt. The belt is shown to carry a tissue web to a Yankee drying cylinder, where the tissue web is transferred from the belt to the cylinder at a nip formed between a roll and the cylinder. As discussed in the present application, this transfer is not always accomplished reliably because the tissue web tends to remain on the smooth belt following exit from the nip. (Specification; page 1, line 22 to page 2, line 9).

Steiner et al. teaches (column 2, lines 15 through 18) that the smooth belt is impermeable to water, and that the forces of adhesion between it and a paper sheet are greater than those

between any press fabric and a paper sheet. This is because the belt is much smoother than a press fabric. Moreover, a thin water film between the belt and the paper sheet keeps the sheet on the belt and is the source of the adhesion between the two.

Figures 6 and 7 of Steiner et al. show the transfer of a paper sheet directly from the belt to the surface of a Yankee cylinder at a nip. However, there is no teaching whatsoever in Steiner et al. on how the forces of adhesion acting between the paper sheet and the belt can be overcome on contact with the Yankee cylinder. Those of ordinary skill in the art would readily appreciate that such a transfer, that is, from a smooth belt to a smooth Yankee cylinder, would not occur reliably, if at all.

Eklund et al. shows a transfer belt whose surface has a pressure-responsive recoverable degree of roughness. That is to say, the transfer belt has a smooth surface when compressed in a press nip, but a relatively rough surface when not in a press nip. This property enables a paper web to be removed from the transfer belt downstream from a press nip by a vacuum transfer roll.

In the present invention, as claimed most broadly in claim 1, a belt of the variety shown in Eklund et al. is used to

transfer a tissue web to a Yankee drying cylinder at a nip. However, Eklund et al. teaches that the surface of the transfer belt becomes smooth in a nip, and that, as a consequence, a paper or tissue web would not be readily removable at such a point.

More specifically, in Eklund et al., the transfer belt in question is shown to carry a paper web through press nips. It should be noted, however, that without exception, the paper web is carried from the nip on the surface of the belt because the belt is smoother (in the nip) than the press fabric used to dewater it. Transfer from the surface of the transfer belt is always shown to be accomplished using a vacuum-transfer roll, not a nip, such as that formed by two rolls. The Eklund et al. reference does not teach or suggest that a paper web could be transferred from the transfer belt in a press nip.

Moreover, Eklund et al. clearly teaches that the belt is smoothest under compression, that is, in a press nip. Eklund et al. also teaches that the smoothness under compression is what allows the water film which keeps the sheet firmly in contact with the belt surface to form in the first place. Sheet release occurs outside a press nip because of increasing surface roughness as the belt expands, and because the

hydrophilic/hydrophobic areas allow water beads to form from the water film between the paper web and the surface of the belt. Both of these effects allow the sheet to be released from the surface of the belt outside of a nip.

Accordingly, the present invention, now claimed most broadly in claim 1 as an improvement for a tissue machine in which the belt shown in Eklund et al. carries a tissue web to a Yankee drying cylinder and transfers the tissue web to the cylinder at a nip, is neither shown nor suggested by the combined teachings of Steiner et al. and Eklund et al., because Eklund et al. teaches away from this. Therefore, claim 1 is respectfully submitted to be patentable thereover, as are claims 2, 3, 4, 6 and 8 which depend from and further limit the subject matter claimed in claim 1.

Claim 5 was finally rejected as being unpatentable for obviousness over Steiner et al. in view of Eklund et al. and further in view of U.S. Patent No. 4,529,643 (Lundström). Claim 5 is a dependent claim further limiting the subject matter claimed in claim 1 by requiring that the polymer layer completely enclose the carrier.

Lundström shows a press fabric whose structure is filled with a rubber or resin emulsion to reduce its overall

permeability. The object is to reduce blowing, rewetting and adhesion problems. While the press fabric is used to convey a paper web through a press section, there is neither teaching nor suggestion in Lundström on how a wet paper web is removed from the surface of the press fabric. As such, one of ordinary skill in the art would not be taught, by reading Lundström, that this could be accomplished at a press nip with a Yankee cylinder, in view of the recognition in the paragraph beginning on line 36 of column 1 that a coated belt does not readily release a paper web. Claim 5 is respectfully submitted to be patentable over the combined teachings of the cited references, and for further limiting the subject matter claimed in claim 1.

Finally, claim 7 was finally rejected as being unpatentable for obviousness over Steiner et al. in view of Eklund et al. and further in view of U.S. Patent No. 5,556,509 (Trokhan et al.). Claim 7 is a dependent claim further limiting the subject matter claimed in claim 1 by requiring that the polymer layer is embossed to produce embossed soft tissue.

Trokhan et al. shows a press fabric having a permeable web-patterning layer which imprints a tissue web when the press fabric transfers the tissue web to the surface of a Yankee drying cylinder. The web-patterning layer is not embossed into

the coating of an essentially impermeable belt. Rather, it is formed by coating the surface of the press fabric with a photosensitive resin which is then selectively cured by directing actinic radiation through a mask to provide the permeable web-patterning layer with the desired pattern. In other words, the press fabric is not completely coated by the web-patterning layer when its manufacture is complete, and it is not an embossed layer. Moreover, while the web-patterning layer imprints the tissue web onto a Yankee cylinder, transfer is effected through the use of a creping adhesive. Trokhan et al. does not show or suggest that the belt shown in Eklund et al. might be used to transfer a tissue web to a Yankee dryer cylinder at a press nip, even if the belt were embossed. Claim 7 is respectfully submitted to be patentable over the combined teachings of the cited references, and for further limiting the subject matter claimed in patentable claim 1.

In view of the preceding arguments, the Examiner is respectfully requested to reconsider claims 1 through 8, and to allow same at an early date.

Respectfully submitted,

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